

THE WATERS OF THE BIG CYPRESS SWAMP

Big Cypress National Preserve is a unit of the National Park Service, located within the Big Cypress Swamp region of southern Florida (see Figure 1). The Big Cypress Swamp extends from the eastern boundary of the Everglades to the west coast, and southward from below the Caloosahatchee River drainage to the estuaries of the Gulf of Mexico. The Big Cypress Swamp consists of approximately 1205 square miles (3120 km²) of primarily wetland habitat and was named for the expansive area where the cypress trees grow.

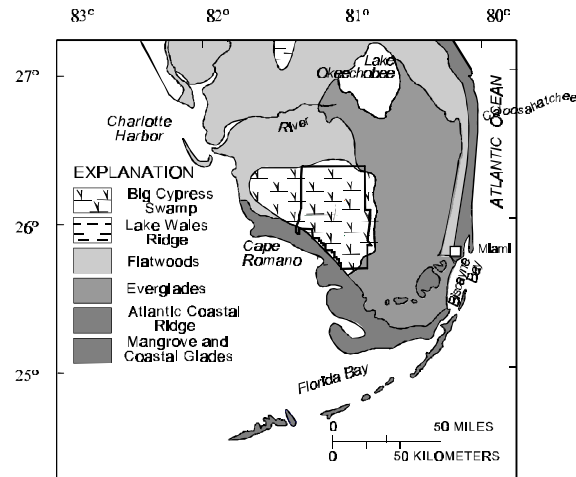


Figure 1. Location of Big Cypress Swamp and other physiographic regions of southern Florida.

THE BIG CYPRESS SWAMP - PAST

Over the past six million years, as the Florida peninsula developed as a landmass, the land was covered and uncovered by a fluctuating sea level. As time passed, new marine sediments were formed on the shallow ocean floor. When the water receded, land areas took identifiable shapes, drainage patterns developed, and vegetation and animals adapted to the area. Surface water drained off slowly in a southwest flowing arc to the Gulf of Mexico. The movement of water was similar to a shallow river without banks, and is referred to as sheetflow. Where the waters dissolved the underlying limestone forming topographic depressions known as “solution holes”, deeper soils accumulated, and the larger cypress trees grow. Thus, the Big Cypress Swamp was formed and still exists today.

THE BIG CYPRESS SWAMP - PRESENT

Since the majority of annual rainfall (approximately 75%) normally occurs during the six month wet season of May through October, sheetflow depth varies from season to season (see Figure 2). This results in some areas becoming intermittently dry and others remaining permanently covered with water. While the majority of the water in this basin is due to rainfall, water also flows from the Kissimmee River and Lake Okeechobee, slowly meandering toward the Florida Bay and the Gulf of Mexico. The abundant rainfall also contributes to the recharge of the underlying shallow aquifer. The shallow soils, only a few inches deep in many places, support a variety of grasses, shrubs and small cypress trees. The environment that formed, combined with the subtropical climate, enabled the development of agricultural areas to the east and west of the Preserve - and the ensuing urbanization was not far behind.

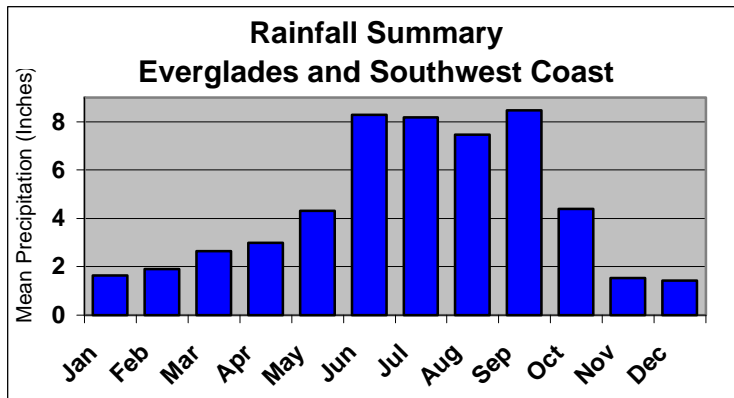


Figure 2. Rainfall in Southern Florida.

Growth in south Florida began in the early 1900's with urban expansion along the east coast and the introduction of agriculture into the Everglades lying east of the Big Cypress Swamp. In recognition of the impact of this problem, Everglades National Park was established in 1947 to protect the southern end of the Everglades drainage. Included within the boundaries of this newly established Park was the estuarine environment at the lower end of the Big Cypress Swamp drainage along the Gulf of Mexico. Congress created the Big Cypress National Preserve in 1974, in recognition of the significant role of the Big Cypress Swamp in the total management of south Florida's water resources. In 1988, Congress increased the area of the Preserve to a total of 728,866 acres (294,969 hectares).

BIG CYPRESS NATIONAL PRESERVE - THE CHALLENGE OF WATER MANAGEMENT



The Preserve today faces many impacts on the water resources that were present when the Preserve was established and others that have arisen since. Unlike legislation establishing National Parks, the legislation for the Preserve provides for the continuation of specific on-going activities including - exploration and extraction of oil, gas and other minerals; off-road vehicle use; grazing; traditional cultural land uses; agriculture; and existing private ownership of lands. These recreational and traditional activities all have the potential for causing major impacts to the waters of the Big Cypress Swamp.

Big Cypress Swamp was not without intrusions. In the 1900's, roads, canals, levees and borrow pits interrupted the natural drainage of the area. Significant among these include:

- U.S. Highway 41 (Tamiami Trail) and Interstate 75 (Alligator Alley) which cross the Preserve in an east-west direction, act as dams to the natural north-south flow patterns. Surface water flow is intercepted by the borrow canals that parallel these major roadways and are redirected to the nearest bridges or culverts beneath the roadway, thus altering the natural patterns of flow.
- The north-south flowing Barron River Canal and Turner River Canal which accelerate the local drainage, producing unnatural variations in both water level and flow. The Barron River Canal also drains private lands from the north into the Preserve, increasing the potential for pollutants to enter the Preserve.
- The L-28 Levee which extends northward from the Tamiami Trail along the eastern boundary of the Preserve, forming an approximate boundary between the Everglades and Big Cypress Swamp



drainages. The levee and associated borrow canal disrupt the natural flow of waters draining from the northeastern part of the Preserve.

■The L-28 Interceptor Canal, which is in the extreme northeastern corner of the Preserve. This canal rapidly drains water from the agriculturally active lands into the Preserve.

THE PRESERVE - MEETING THE CHALLENGE

Fulfilling the legislative mandate to protect the water resources of the Preserve is a two-fold challenge:



First, to properly manage the natural resources and permitted activities within the Preserve, and

Second, to meet the Preserve's on-going responsibility in the overall coordinated management of south Florida's water resources.

Meeting this two-fold challenge requires a careful balance of identification, preservation, and/or restoration of the natural environment of the Preserve while also supporting and protecting the natural ecosystems of the Everglades National Park and adjacent environments. The mere size of the Preserve - 728,866 acres (294,969

ha)- most of which are wetlands, dictates the necessity for a comprehensive management program to protect the integrity of this relatively pristine environment.

In response to the challenge, the Preserve has established a monitoring network of 14 sites to provide vital data on the waters of the Preserve. A Visitor Center Park Ranger can direct you to an easily accessible monitoring site. Surface water levels are measured continuously using electronic recorders and water quality samples are collected and analyzed by National Park Service staff at each of these sites. The Preserve also maintains seven meteorological stations, which include daily rainfall totals, as well as temperature and relative humidity. The primary purpose for intensive water quality analysis in the Preserve is to observe the health of its waters and to restore impacted areas back to natural conditions.



Monitoring stations were strategically placed to measure both overall baseline hydrological conditions in the Preserve and impacts to the water from internal and external sources. Data from these monitoring stations can be accessed via the World Wide Web at the South Florida Water Management District web site:

http://www.sfwmd.gov/curre/2_techdata.html.



Examples of active or completed hydrologic monitoring and restoration projects in the Preserve include:

■Turner River Restoration Project: roads and canals within its watershed impact the natural flow regime of the Turner River. These roads and borrow canals intercept recharge waters for the river's watershed reducing the river's natural flow. In response to this problem, the Preserve installed a series of earthen plugs in the borrow canals, built culverts beneath Turner River Road, allowing surface water to continue a natural flow through the river's traditional watershed, and filled in the borrow canal south of the Tamiami Trail to impede over-draining of the watershed.

■Raccoon Point Minerals Monitoring: The drilling and production operations at the Raccoon Point oil field are monitored following specifications outlined in the Preserve's Minerals Management Plan. Surface water and ground water monitoring sites have been established around the operational pads and the hydrological information is reviewed to evaluate environmental compliance.

■U.S. 41 and Loop Road (C.R. 94) Culvert Project: In a cooperative effort with Monroe County, 20 culverts were installed beneath Loop Road in 1995 to improve the surface water sheetflow in the area. The South Florida Water Management District has installed 4 water stage recorders in the project area to continuously monitor the surface water stage and discharge. The Preserve installed twenty-five additional culverts in 1997 to further improve the local drainage impacted by Loop Road and U.S. 41.

BIG CYPRESS NATIONAL PRESERVE - ITS FUTURE



In 1996, the Preserve completed a Water Resources Management Plan (WRMP) to address numerous hydrological issues. Input was solicited from many sources: Federal agencies - US Geological Survey, US Army Corps of Engineers; State agencies, including the South Florida Water Management District, County officials, and the Seminole and Miccosukee Indian Tribes. During the WRMP's external review process, these agencies were consulted to reinforce the regional cooperative focus of the National Park Service. The WRMP may be reviewed upon request at the Visitor Center. The WRMP includes:

- **A Review** of existing legislation and hydrological information, an
- **In-depth Analysis** of water resources issues, and
- **An Action Plan** to address these issues.

Future Action Plans include:

- Expansion of the existing hydrologic monitoring network - Collecting more water quality information at more sites.
- Development of a water quality baseline for the Preserve - By assembling all available water quality data, and analyzing it to determine ambient water quality conditions in the region.
- Assessment and mitigation of impacts from the L-28 Interceptor and L-28 Levee systems on water resources.
- Continued hydrological monitoring at oil and gas operation sites.
- Identification and implementation of wetland reclamation projects.

This Plan is proving to be an excellent management tool in the dynamic hydrological and political environment of south Florida. It should take the Preserve into the 21st century as an important part of the South Florida Ecosystem Restoration efforts.

BIG CYPRESS NATIONAL PRESERVE -WHAT YOU CAN DO TO HELP



■ Don't Litter - Preventing Pollution protects our Water Resources. Remember that the water of the Big Cypress Swamp recharges the shallow aquifer, where we get our drinking water. The Gulf of Mexico fisheries also depend upon clean, fresh water delivered at appropriate times to the estuarine environment in order to maintain a healthy habitat.

■ Be Aware of Your Surroundings - Take notice of things that look wrong or out of place, and report it to the Preserve at the phone number on this brochure.

■ Use Water Wisely - Although the water resources of the Preserve may seem vast and inexhaustible, they are finite. Your thoughtful use of water as a visitor will help ensure the integrity of this valuable resource for future generations.

■ Enjoy the Preserve - It's here for you.



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